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A Summary of Monthly Nutrient Values for Research Pastures in the Growing Months

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Summary and Implications

This analysis shows that research pastures contain sufficient protein and in most months energy to maintain a beef cow during the lactation phase of the yearly beef production cycle. Crude protein in comparison to the needs of a 1400 pound lactating beef range from 113 percent to 220 percent of the requirement. Energy in comparison to the same need ranged from 87 percent to 118 percent. Eleven of 36 months evaluated were below energy needs. However, previous research has demonstrated that cattle will have selected forage intake that is 3 percent higher in digestible dry matter.

Introduction

Grazing pastures in the summer time remains the most economical way of managing beef herds in the state of Iowa. Most Iowa herds are calved in the late winter or early spring, thus cows rely on pasture for their nutritional demands to maintain body weight, produce milk for their calves and breed back for their next calf.

To accomplish profitable beef production, pastures must supply sufficient dry matter of acceptable quality. Pasture quality can and does fluctuate during the growing season, thus at times thrusting the producer and his herd in to periods of inadequate nutrient supply. Adding to the complexity of this is the changes that occur in nutritional demands from a cow-calf unit. The calf is growing and starting to consume more forage and the cow is being asked by the calf to produce more milk.

The question is: How do Iowa pastures vary in quality and are there periods of potential inadequate forage supply and quality?

Material and Methods

A number of studies on grazing management, forage types and stockpiling routines have been conducted by graduate students in Animal Science at Iowa State University. 495 samples from 1994 to 2002 have been obtained and analyzed from 6 pasture species/specie mixes during the growing months of May through October. Standard laboratory procedures have been done to obtain crude protein, invitro dry matter digestibility, acid detergent fiber, neutral detergent fiber, acid detergent insoluble nitrogen and estimates of energy. Statistical analysis on the database was done using SAS General Linear Models.

Results and Discussion

Table 1 shows the averages by month for the forage types in the ISU experiments. As should be expected, crude protein begins high during the early part of the spring/summer growing season and then gets lower with time. However, it is worthy of notice that none of the forage types are below the requirements of the March calving cow weighing 1400 pounds producing 20 pounds of milk at peak lactation.

Also listed in table 1 is the fiber and energy analysis of the grazed forages. Fiber components begin low in the early part of the growing season and then increases. This coincides with the plants going from a vegetative state in early to mid spring to the reproductive state in early to mid summer. Energy, as shown, tends to start quite high in the earlier parts of the growing season and then declines during mid summer. Although this data set did not include mid fall regrowth data, it is not unusual to see the energy values improve. If the forages are clipped in the summer they will return to the vegetative state (with ample moisture) and be lower in fiber and higher in energy.

In reviewing the monthly averages there are a few months that particular forages are below what the March calving cow would need. However, it is important to know that grazing animals do not eat what the average clipped sample has for nutrient analysis. Instead grazing animals selectively graze forages and consume a significantly higher quality diet. But keep in mind this selectively can only take place when sufficient growth is available.

In a study published in 2000 by Schlegel et al., it was found that grazing steers selected forages that had 9.7% greater crude protein and 23.0% greater energy than the clipped pasture samples would indicate. This is supported by other studies reported by Coleman and Barth (1973) and Fisher et al. (1991) who reported steers grazing grass-legume pastures selected forage 18 to 30% greater in crude and protein and 3% greater in digestible dry matter. If one assumes a 10% increase in crude protein and energy values that would mean all but the Southern Iowa Pasture type would easily meet the nutritional demands. Many of pastures sampled in the Southern Iowa Pastures study were predominantly bluegrass based and quite low on dry matter productivity.

Acknowledgments

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Table 1. Crude protein and TDN averages by month for Iowa pasture forages.

	April	May	June	July	August	September
	Crude Protein Averages					
Alfalfa-Brome		21.7	13.8	15.4	14.7	13.8
Brome-Orchard-Trefoil	15.8	11.8	11.6	14.3	13.6	13.0
Southern Iowa Pastures	17.1	14.2	10.8	10.9	11.4	11.9
Smooth Brome		22.7	13.1	14.0	14.7	16.6
Smooth Brome-Red Clover		15.5	12.5	13.1	12.7	
Tall Fescue-Red Clover		15.5	13.2	14.0	14.4	
March Calving Cow*	**9.8**	**10.3**	**9.6**	**8.9**	**8.3**	**7.7**
	Acid Detergent Averages					
Alfalfa-Brome		25.4	36.3	31.8	32.5	32.3
Brome-Orchard-Trefoil	27.4	33.9	34.3	33.2	32.8	34.4
Smooth Brome		26.2	33.3	30.6	30.2	28.0
Smooth Brome-Red Clover		27.5	30.0	30.6	31.5	
Tall Fescue-Red Clover		25.1	29.3	29.6	31.1	
	Neutral Detergent Fiber Averages					
Alfalfa-Brome		43.9	56.8	51.8	55.3	56.9
Brome-Orchard-Trefoil	48.9	56.6	57.1	55.8	56.3	57.9
Smooth Brome		52.0	60.2	51.7	58.0	56.2
Smooth Brome-Red Clover		56.9	55.8	57.1	58.1	
Tall Fescue-Red Clover		52.9	53.4	56.3	56.3	
	Invitro Dry Matter Digestibility Averages					
Alfalfa-Brome		62.1	51.8	52.3	53.0	51.5
Brome-Orchard-Trefoil	56.5	55.2	56.0	56.7	55.8	54.6
Southern Iowa Pastures	53.8	55.1	50.0	46.7	45.1	44.3
Smooth Brome		65.1	55.7	55.0	56.6	57.4
Smooth Brome-Red Clover		50.6	55.0	56.2	54.1	
Tall Fescue-Red Clover		55.4	56.4	57.3	55.4	
	Calculated TDN Averages					
Alfalfa-Brome		64.1	53.8	54.3	55.0	53.5
Brome-Orchard-Trefoil	58.5	57.2	58.0	58.7	57.8	56.6
Southern Iowa Pastures	55.8	57.1	52.0	48.7	47.1	46.3
Smooth Brome		67.1	57.7	57.0	58.6	59.4
Smooth Brome-Red Clover		52.6	57.0	58.2	56.1	
Tall Fescue-Red Clover		57.4	58.4	59.3	57.4	
March Calving Cow*	**58.0**	**59.1**	**56.8**	**55.5**	**54.1**	**53.0**
*1400 lb Cow with 20 lb peak milk production						